UNIVERSITY OF ILLINOIS EXTENSION
College of Agricultural, Consumer, and Environmental Sciences

Illinois Fruit and Vegetable News

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a newsletter for commercial growers of fruit and vegetable crops

"We are what we repeatedly do. Excellence, then, is not an act, but a habit." Aristotle

Address any questions or comments regarding this newsletter to the individual authors listed after each article or to its editor, Rick Weinzierl, 217-333-6651, weinzier@uiuc.edu. The ***Illinois Fruit and Vegetable News*** is available on the web at: http://www.ipm.uiuc.edu/ifvn/index.html . To receive email notification of new postings of this newsletter, call or write Rick Weinzierl at the number or email address above.

In this issue ...

Upcoming Programs …

- **Jersey County Orchard Twilight Meeting, April 17, 2007, 6:00 p.m**., Joe Ringhausen Orchard, 67 S. State Street (US 67), Jerseyville.
- **Tri-State Organic IP Video Series: Insect and Disease Management in Organic Vegetables**, **April 19, 2007,** 5:00 – 7:30 p.m.; this is the third of five sessions to be held from February through November; several sites throughout Illinois serve as host locations for each session. For more information, contact Deborah Cavanaugh-Grant at 217-968-5512 or cvnghgrn@uiuc.edu, or check the web site at https://webs.extension.uiuc.edu/registration/default.cfm?RegistrationID=510
- **Calhoun County Orchard Twilight Meeting, May 22, 6:00 p.m**., Murray's Orchard, just north of Mosier, IL. From Hardin, go north to Kampsville, and turn left (west) on State Route 96. Follow the right hand turn to stay on State Route 96, and then turn right onto Crooked Creek Road (at the white church on corner). Go about a _ mile, and Murray's Orchard is the first driveway on the right.

Regional Updates

In southern and southwestern Illinois, spring has sprung. Record highs have resulted in significant changes in the landscape, and a significant increase in field operations. And everything is happening in a hurry. Apples are at half-inch green to tight cluster, with European pears at full bloom. Peaches are at bloom to petal fall with cherries at tight cluster. Bramble primocanes are up and showing significant growth, while the floricanes are breaking bud. Blueberries are close to bloom in the far south, but not quite as far along closer to I-70. The earlier grape varieties such as 'Foch' were at bud swell on St. Patrick's Day, and later varieties such as Chambourcin are at bud swell now. For those still pruning grapes in the southern region, great care should be taken because buds are very delicate and easily broken off. Strawberries have been uncovered for several weeks and are showing good growth. Overall, there has been minimal winter kill in fruit crops to date.

Two twilight meetings have been scheduled in the Calhoun/Jersey County area for tree fruit growers. The first twilight meeting is scheduled for April 17 at 6:00 p.m. at the Joe Ringhausen Orchard, 67 S. State Street (US 67), Jerseyville. The second is scheduled for May 22 at 6:00 p.m. at Murray's Orchard just north of Mosier, IL. From Hardin, go north to Kampsville, and turn left (west) on State Route 96. Follow the right hand turn to stay on State Route 96, and then turn right onto Crooked Creek Road (at the white church on corner). Go about a _ mile, and Murray's Orchard is the first driveway on the right.

Overnight it seems the fields have been plowed. Two successive plantings of sweet corn are already in for several growers throughout the region. Conditions have been good for early establishment of most of the early season crops as well, including potatoes going in traditionally around St. Patrick's Day. Last season's horseradish is still being dug, and the new crop should start going in very soon. Harlequin bugs were observed on crowns and foliage in fields still to be dug (reflecting successful overwintering), but it's unlikely that they'll move to new horseradish fields in large numbers. Transplanting of tomatoes in high tunnels began last week.

Elizabeth Wahle (618-692-9434; wahle@uiuc.edu)

At the Dixon Springs Agricultural Center, plasticulture strawberries are in bloom. Growers should monitor patches for eastern flower thrips and for voles. Voles seem to be dramatically worse this year across southern Illinois. Where you see three or four weak strawberry plants in a row, cut the plastic and look for droppings or burrows from voles. Needing an enormous number of couplers to return the trickle system to function is another good indicator you have or had a vole problem. As growers make fungicide applications, please remember to rotate chemistries (modes of action) to avoid problems with resistance development.

Peaches are largely at petal fall and apples at pink. Blueberries should be in bloom very soon.

Plasticulture strawberries at the Dixon Springs Ag Center.

Growers have planted tomatoes in high tunnels, and they are off and running. Actually a few planted outside in the field are also off and running with the record warm temperatures we have been havening. No bets have been placed on the field-grown tomatoes … still a lot of April left … like all of it, including the 1st to the 15th. Early sweet corn is germinating and should emerge in a day or two.

Tomatoes in a high-tunnel in southern Illinois.

Jeff Kindhart (618-695-2444; jkindhar@uiuc.edu)

In northern Illinois, a mix of cloudy and clear days, with high temps into the upper 70s, have brought signs of spring. Rainfall amounts of 1 to 3 inches have been common, with greater accumulations nearer the Mississippi River, so field preparation activities have been minimal. Tree fruits and small fruits are still dormant, and pruning of apples, peaches, brambles and grapes is still going on in many orchards. Growers who produce their own vegetable transplants have started seedling production in greenhouses.

Maurice Ogutu (708-352-0109; ogutu@uiuc.edu)

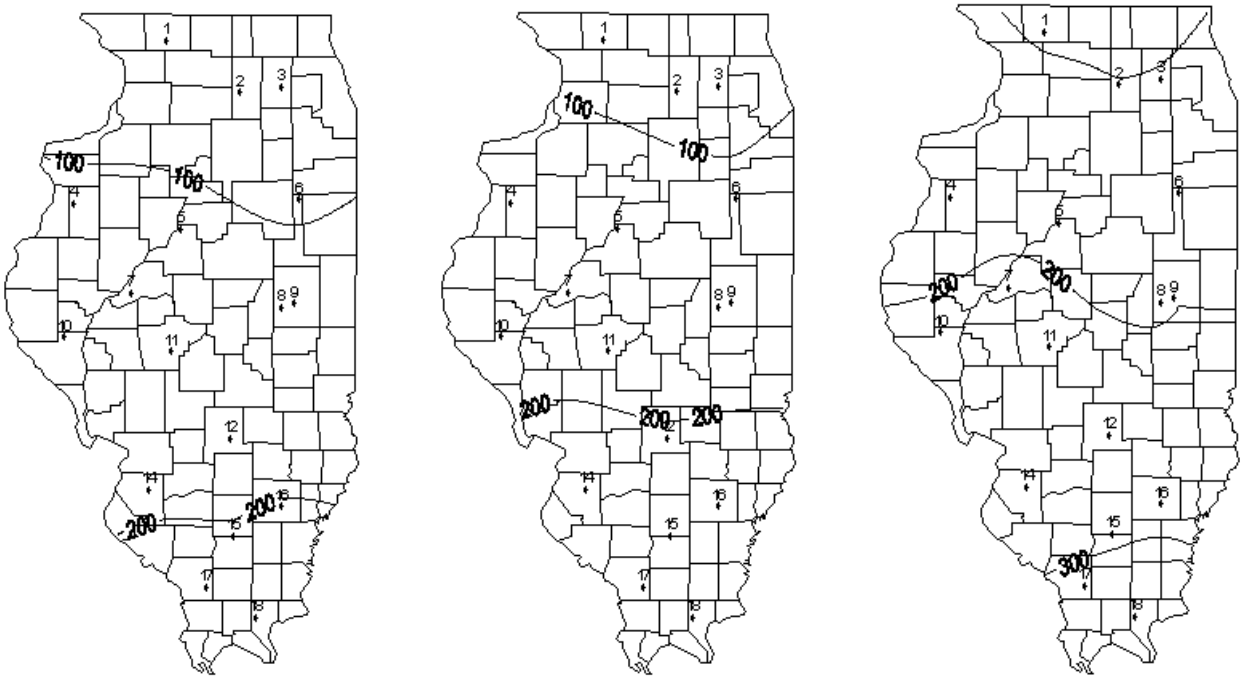
Degree-day Accumulations

Degree-day accumulations listed below for weather stations in the Illinois State Water Survey WARM data base have been summarized using the Degree-Day Calculator on the University of Illinois IPM site (http://www.ipm.uiuc.edu/degreedays/index.html). The list below includes only degree-day accumulations and projections based on a 50-degree F developmental threshold and a January 1 starting date, but other options that use different thresholds and specific biofix dates are available on the Degree-Day Calculator. The degree-day calculator is available as a result of a joint effort of current and former extension entomologists (primarily Kelly Cook) and Bob Scott of the Illinois State Water Survey. If you have questions about how to use the site, contact me or Bob Scott (rwscott1@uiuc.edu).

Rick Weinzierl (217-333-6651; weinzier@uiuc.edu)

Degree-day accumulations, base 50 degrees F, starting January 1.

Station	County	Base 50F DD Jan 1 – Mar 28, Historic Average	Base 50F DD Jan 1 – Mar 28, 2007	Base 50F DD Jan 1 – Apr 4 (Projected)	Base 50F DD Jan 1 – Apr 11 (Projected)
1. Freeport	Stephenson	41	59	75	93
2. Dekalb	Dekalb	51	60	80	101
3. St. Charles	Kane	50	67	84	102
4. Monmouth	Warren	75	109	133	160
5. Peoria	Peoria	85	125	151	181
6. Stelle	Ford	67	86	109	135
7. Kilbourne	Mason	129	154	184	219
8. Bondville	Champaign	96	129	154	185
9. Champaign	Champaign	99	143	167	198
10. Perry	Pike	130	147	177	212
11. Springfield	Sangamon	114	156	183	219
12. Brownstown	Fayette	154	173	204	247
13. Olney	Richland	152	Missing	Missing	Missing
14. Belleville	St. Claire	190	192	226	272
15. Rend Lake	Jefferson	187	204	240	291
16. Fairfield	Wayne	173	203	238	286
17. Carbondale	Jackson	208	224	260	309
18. Dixon Springs	Pope	224	243	283	337



Degree-day accumulations, base 50 F, from January 1 – March 28, 2007 (left), and projected through April 4 and April 11.

Notes from Chris Doll

The last frost/freeze was on March 18, and for the 10 days through March 28, the average daily high temperature has been 78 degrees. This has caused rapid development of all fruit crops. Peaches are in petal fall stage, sweet cherries are approaching full bloom, Japanese plums are at late petal fall while European plums are at first bloom. Apples range from cluster bud to cluster separation, and grape buds are swollen. Peach bloom ranged from 100 percent on Encore to 30-40 percent on Red Haven and Cresthaven. The latter varieties will still need thinning if fruit set is good. One of my observations in the Back-40 is that many of the new peach and nectarine varieties from the USDA and California breeding programs are early bloomers. This is not a problem unless spring freezes happen at the wrong time.

I mentioned the use of fall sprays of Ethrel on peaches to delay bud break. It has been very successful on many of my trees this year, with a 3-5 day delay in bloom. However, my experimental program of half-tree treatments has really compounded spraying times. Full pink was too early for the untreated half of the tree, and the later bloom from the Ethrel side means late application of the petal fall spray In other words, the 50 varieties have the normal varietal variation plus the chemical-induced variation.

According to my records, the last time we had a peach bloom this early was in 1995. In the last 36 years, full bloom was earlier three times. Some apple growers will probably see some pink in March, but only in 1991 did I record a full pink stage before April 1.

Locally, rainfall is below normal for both the month and the year, but soil moisture seems ample and planting is on going. The first OFM moths were caught on the 27th, and leaf miner and San Jose scale traps remain empty.

IN MEMORIUM: John Tanner of Speer died on March 16 at the age of 93. John was the founder of Tanner's Orchard, now one of the state's fine orchards and farm markets, in 1947. He and his wife Margaret ran the operation until 1977 when sons Harold and Richard became partners with them. John then retired in 1981. Margaret preceded him in death in 2003, and he is survived by the two sons and daughters Wilma Knobloch and Nancy Stoller, and 14 grandchildren and 30 great-grandchildren. John was well known around the state as a buyer of produce for the market and for his support of the apple industry. He was a past president of the Illinois State Horticulture Society and a member of its Hall of Fame.

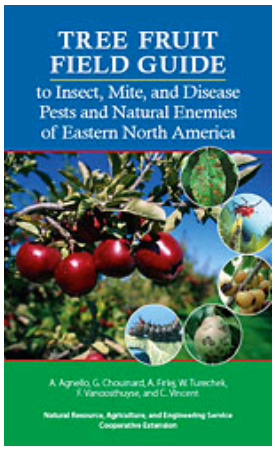
C*hris Doll*

Fruit Production and Pest Management

Not Much of a Plot, But What a Cast

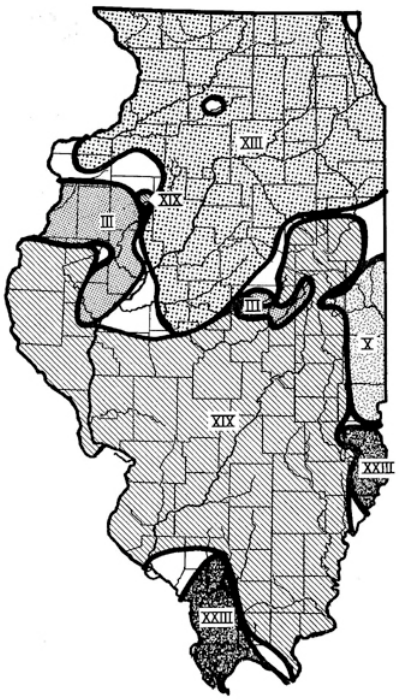
This brief entry is taken from the March 19, 2007, issue of Scaffolds, the tree fruit newsletter from Cornell University in New York (http://www.nysaes.cornell.edu/ent/scaffolds/2007/070319.html).

Last October, after 4 years of work, we published a new reference that should be of interest to growers, consultants, biologists, extensionists, students, and home fruit growers. The Tree Fruit Field Guide to Insect, Mite, and Disease Pests and Natural Enemies of Eastern North America (Agnello, Chouinard, Firlej, Turechek, Vanoosthuyse, and Vincent) is a 238-page handbook of fact sheet-type entries, including color photos, descriptions and actual-size drawings, distribution, damage symptoms and general management recommendations, to help growers identify pest insects, mites, and diseases that cause damage in the orchard, as well as beneficial insects, spiders, and mites that can be found in tree fruit plantings. It includes over 25 pages of diagnostic keys to insect and mite damage and disease symptoms, a glossary, and an index/cross-reference to common, scientific, and family names; also, a list of recommended sources for further information, including useful Internet sites. The book is available through NRAES (Natural Resource, Agricultural, and Engineering Service) in Ithaca, through its website: www.nraes.org, and can be ordered online for $32 retail (pub No. NRAES-169). Quantity discounts are available.



(Art Agnello, Entomology, Cornell University – Geneva, NY)

Periodical Cicadas … This is the Year in Northern Illinois



Broods of periodical cicada in Illinois.

Yes, it's true. In northern Illinois, including the Chicago metropolitan area, Marlatt's Brood XIII of the 17-year cicada, also known as the Northern Illinois Brood, will emerge in 2007 in the area marked XIII on the map above. Expect emergence when soil temperatures just below the soil surface reach 64 degrees F – by mid May to early June. Cicadas damage trees and shrubs by using their saw-like ovipositor (egg-laying organ) to cut a slit in twigs or shoots, then they lay their eggs into the slit. Nymphs later hatch and drop to the ground, where they burrow down to roots and begin their 17 years of feeding and development below the soil surface.

Years of emergence for the broods shown on the map above are as follows:

- Lower Mississippi River Valley Brood (Marlatt's XXIII): 13-year cycle, last emerged in 2002; next emergence in 2015.
- Iowan Brood (Marlatt's III): 17-year cycle, last emerged in 1997; next emergence in 2014.
- Great Southern Brood (Marlatt's XIX): 13-year life cycle, last emerged in 1998; next emergence in 2011.
- Great Eastern Brood (Marlatt's X): 17-year cycle, last emerged in 2004; next emergence in 2021.
- Northern Illinois Brood (Marlatt's XIII): 17-year cycle, last emerged in 1990; next emergence in 2007.

For an interesting look at cicadas (and even recordings of the songs of different species), check out the University of Michigan's Periodical Cicada Page at: http://insects.ummz.lsa.umich.edu/fauna/michigan_cicadas/Periodical/Index.html. Also see the University of Illinois web site on cicadas at: http://web.extension.uiuc.edu/cicadas/index.html.

Rick Weinzierl (217-333-6651; weinzier@uiuc.edu)

Insecticides for Apple Pest Management

In the last few years several new insecticides have been registered for use on apples, and at the same time others have been removed from use or the numbers of applications or timing of their use has been restricted. I encourage Illinois growers to check the 2007 Midwest Commercial Tree Fruit Spray Guide (http://www.extension.iastate.edu/Publications/PM1282.pdf) and the production guides from nearby states, as well as the summaries carried by trade publications such as the Good Fruit Grower and Fruit Grower's News. In addition, here are some specific observations for Illinois growers.

- First, remember the differential importance of specific insects around the U.S. and within Illinois. Neither plum curculio nor apple maggot occurs in Washington state's apple-producing region, so a spray program that might be adequate there will not be appropriate here if it does not also control these pests. For example, neither Rimon nor SpinTor/Entrust is effective against plum curculio, and neither Rimon nor Intrepid is effective against apple maggot. Also note that apple maggot is not a problem in Illinois south of I-70 (or even a little further north) but codling moth completes 3 or more generations in the south instead of two in far northern Illinois, so a summer spray program can differ considerably in northern versus southern Illinois.
- Always consider the differential effectiveness of specific insecticides against different pests. Intrepid works only against Lepidoptera (codling moth, oriental fruit moth, leafrollers, etc.). Against the pests of tree fruits, Rimon also is effective primarily against Lepidoptera, though it does give some knockdown of Japanese beetle as well. Provado and Esteem are effective against sucking insects such as leafhoppers, aphids, and scales, though of these two, only Esteem is adequately effective against scale crawlers. Assail, Calypso, and Clutch are somewhat more broadly effective – to varying degrees they control curculio, apple maggot, Lepidoptera, and the sucking insects listed above. Complicate your view of this by remembering that insecticides that may be effective against certain insects not only fail to kill other pests but they kill those pests' natural enemies, "releasing" them from predation or parasitism and favoring their outbreaks as secondary pests. For example, pyrethroids and neonicotinoids are more toxic to predaceous mites than Imidan or Guthion are, so European red mites normally held in check by these predators may flare up where pyrethroids or neonicotinoids are used. (Among the pyrethroids, Danitol is the only one that provides some control of European red mite and twospotted spider mite, so while it kills predators too, at least it has some direct benefit against the pest species.)
- Next, remember the importance of insecticide resistance – consider resistance problems that already are known as well as practices that can favor or discourage the development of new resistance problems. Published data and field observations suggest that codling moth populations that are resistant to the OPs such as Guthion, Imidan, and diazinon show some degree of resistance to Intrepid and Asana (and other pyrethroids) as well. To control these populations, using neonicotinoids (Assail, Calypso, or Clutch) or Rimon may be key, but preventing resistance to these newer compounds requires that they not be overused either. Label restrictions also limit the number of applications for these compounds, so using them in a limited fashion is not only wise, it's the law.

- So, what might be a good spray program IF TRAPPING AND OTHER SAMPLING METHODS INDICATE THE NEED TO CONTROL CODLING MOTH AND THE FOLLOWING PESTS beginning at petal fall?
    - For plum curculio control at petal fall, consider the use of OPs (Imidan or Guthion) or Avaunt. The kaolin clay product Surround, perhaps tank- mixed with a natural pyrethrin, is the best choice for organic growers; see product information on repeated applications of Surround to build up necessary residues.
    - In northern Illinois, where apple maggot control may be an issue from mid-June through August, consider using Rimon at 20 to 30 fl oz per acre for 2 successive sprays at a 14-day interval (or slightly longer) for first generation codling moth control, beginning as early as 100-150 degree-days (base 50 F) after traps begin to catch moths consistently (biofix) or 10-14 days after the petal-fall application of Avaunt, Imidan, or Guthion for curculio control. According to the label, you may use only 2 applications of Rimon per season. First-generation codling moth control may need to span roughly a 6- to 8-week period, so if you take this approach (2 Rimon applications as noted), you may need to finish off first-generation control with one or even two applications of Guthion, Imidan, or another product that kills apple maggot as well as codling moth, depending on the occurrence of apple maggot flies on traps. When second generation codling moth and apple maggot combine as concerns in midsummer (and later), Assail, Calypso, or Clutch might be used as primary spray components to provide codling moth, apple maggot, and leafroller control, as well as control or suppression of leafhoppers, leafrollers, and Japanese beetle. For organic growers, Entrust is moderately to highly effective against apple maggot and codling moth, and a bait formulation containing the same active ingredient (spinosyns) is available under the trade name GF-120 for apple maggot control. The most economical approach for organic growers might be to use mating disruption against codling moth and GF-120 for apple maggot control. See "Organic Cherry Fruit Fly Control with Spinosad (Enrust, GF-120 bait), Compared to a Conventional Provado Standard and an Untreated Check" and "Bait Application," both by Tim smith of Washington State University, as well as the product label for more information on GF-120.
    - In southern Illinois, apple maggot is not a concern, and timing the use of Rimon is not complicated by the need to control this pest, so growers might choose to use Rimon for first or for second generation codling moth control. As noted above, it will not control plum curculio, so petal fall application of Imidan, Guthion, or Avaunt is recommended where this pest is a problem (most orchards). Where control of first generation white apple leafhopper or potato leafhopper is usually necessary, it may be most efficient to use one of the neonicotinoids (Assail, Calypso, or Clutch) for first generation codling moth control, because these insecticides also control leafhoppers (Rimon does not).
    - SpinTor (named Success in the west) and Entrust are formulations of spinosyns, compounds naturally produced by soil microorganisms and produced as insecticides in fermentation tanks. Entrust is formulated in a manner that allows it to be listed by OMRI (Organic Materials Review Institute) for use in organic production. In general, these formulations of spinosyns have been moderately effective against codling moth if applied on 10-day intervals. Note that the maximum number of applications allowed per season for Entrust is 3, so it cannot be the sole component of a season-long spray program for codling moth control.
    - Finally, some very specific options for codling moth control are the use of codling moth granulosis virus or mating disruption. Mating disruption products include dispensers to be applied at rates of up to 400 per acre (Isomate and NoMate products), "attract-and-kill" baits that are applied as droplets from a hand dispenser, timed-release "puffers," and spray formulations that may be tank-mixed with conventional pesticides and applied through an air-blast sprayer. For those who opt to purchase and use Isomate or NoMate dispensers, be sure to apply them as high in the tree as the label instructs. Products that contain codling moth granulosis virus include Carpovirusine, Virosoft CP4, and Cyd-X. These pathogens are specific to codling moth, and when young larvae consume virus particles on treated fruit, they stop feeding very soon and die within about 3 days. Virus particles shed by dieing larvae may be consumed by later larvae, so some cycling may occur through successive generations (though the extent of such spread is relatively low where population densities are very low). Mating disruption dispensers and codling moth virus products may be used in organic production systems. For conventional growers, these tactics generally provide supplemental control, not stand-alone control, of codling moth. For more information, I encourage growers to contact me directly.

Future issues of this newsletter will provide additional information insect management and insecticide selection in apples. For now, growers are advised to plan the general nature of their management plans for plum curculio, codling moth, and apple maggot in advance. That plan should recognize the risk of resistance development and therefore not use any specific insecticide (or class of insecticides with the same mode of action) extensively against both first and second generation codling moth.

Rick Weinzierl (217-333-6651; weinzier@uiuc.edu)

Oriental Fruit Moth Flight Underway

Captures of oriental fruit moth in pheromone traps began last week in far southern Illinois, and flight is underway at least as far north as Edwardsville. Fahrenheit degree-day accumulations since January 1 have reached or exceeded 175 (base 45 F) as far north as

Bloomington, and at least some models predict first flight by 175 DD. Traps at Urbana have yet to catch the season's first moths, however. The next issue of this newsletter will provide biofix dates for oriental fruit moth as well as degree-day accumulations at various locations.

Rick Weinzierl (217-333-6651; weinzier@uiuc.edu)

Vegetable Production and Pest Management

Overwintering Survival of Corn Flea Beetle and Potential for Stewart's Wilt

Seedling phase of Stewart's wilt

The summary here will look a lot like the one from last year, but the 2006-07 winter temps and the forecasts based on those temps are indeed updated, so read on …

Corn flea beetles are the primary vector of Stewart's wilt. *Erwinia stewartii,* the bacterium that causes Stewart's wilt, survives the winter in the gut of the corn flea beetle, and survival of the corn flea beetle is dependent on winter temperatures. Warmer winters result in greater survivorship of corn flea beetles, thus increasing the potential for Stewart's wilt. Using the average temperature of December, January, and February, the potential of Stewart's wilt can be predicted (Table 1).

Table 1. Projected risk of Stewart's wilt based on the average temperatures of December, January, and February.

Average temperature for December, January, & February	Probably of early season wilt	Probably of late season blight
<27° F	Absent	Trace
27 - 30° F	Light	Light to Moderate
30 - 33° F	Moderate	Moderate to Severe
>33° F	Severe	Severe

Corn flea beetles become active in the spring when temperatures rise above 65°F. They feed on corn and transmit Stewart's wilt bacteria to seedling corn plants. The bacterium can spread systemically throughout the plant. Although most commercial field corn hybrids are resistant to Stewart's wilt, the disease is still a concern for susceptible seed corn inbreds and many sweet corn hybrids.

There are two phases of Stewart's wilt, the seedling wilt phase and the leaf blight phase. The seedling wilt stage occurs when seedlings become infected at or before the V5 stage. The vascular system becomes plugged with bacteria, causing the seedling to wilt, become stunted, and die. Infections of older corn plants usually result in the development of the leaf blight phase of Stewart's wilt. This phase is characterized by long, yellow to chlorotic streaks with wavy margins along the leaves. When the late infection phase or "leaf blight phase" of Stewart's wilt occurs after tasseling, it is generally not a concern in sweet corn because ears are harvested before damage occurs.

Based on the recent winter temperatures from the Midwest Regional Climate Center, estimates of early season Stewart's wilt for 2007 are shown in Table 2.

Table 2. 2007 early season Stewart's wilt predictions.

Location	Average temperature, December 2006 through February 2007	Potential of early season disease
DeKalb	25	Trace
Stelle	27	Trace-Light
Peoria	27	Trace-Light
Champaign	29	Light-Moderate
Springfield	30	Light-Moderate
Brownstown	32	Moderate-Severe
Belleville	34	Severe
Carbondale	36	Severe
Dixon Springs	37	Severe

Note that the temperatures for 2006-07 were a little lower than in 2005-06, but only slightly (and because of the late cold period in February). Options for limiting losses to Stewart's wilt include planting resistant hybrids or controlling flea beetles by use of systemic seed treatments (neonicotinoids applied by the seed supplier) or foliar insecticides. For information on the susceptibility of specific hybrids to Stewart's wilt, check the sweet corn disease nursery website provided by Snook Pataky (http://sweetcorn.uiuc.edu/stewarts.html). For more information on corn flea beetle and Stewart's wilt, check the fact sheet at http://www.ipm.uiuc.edu/fieldcrops/insects/corn_flea_beetle/index.html.

Rick Weinzierl (217-333-6651; weinzier@uiuc.edu (adapted from an article from 2006 by Kelly Cook (217-333-4424; kcook8@uiuc.edu) and Jerald Pataky (j-pataky@uiuc.edu) … (http://www.ipm.uiuc.edu/ifvn/volume12/frveg1202.html).

Words of Wisdom … *never jump to conclusions …*

As a respected businessman and community leader, John was particularly embarrassed … he had hurried out the house to make it to the evening's charity banquet on time, but upon arriving, he realized that he had left his dentures in the cleaning tray. It wasn't any easier when he felt compelled to tell the total stranger seated next to him why it was that he was not eating.

To his surprise, the stranger looked at John's mouth, then reached into his jacket pocket and offered a set of dentures … unfortunately they were too small. Not giving up, the stranger reached into his pocket again, producing another set of false teeth, but this time they were too large. Amazingly, the stranger produced yet a third set of dentures, and to John's relief, they fit almost perfectly.

As John and the man next to him began to enjoy their meals, John expressed his gratitude and concluded with the obvious, "How lucky for me that I happen to be seated next to a dentist on this of all evenings." The stranger replied with a smile, "I'm afraid you're mistaken, I'm no dentist … I'm an undertaker."

University of Illinois Extension Specialists in Fruit Production and Pest Management

Extension Educators in Food Crop Horticulture		
Bill Shoemaker, St. Charles Res. Center	630/584-7254	wshoemak@inil.com
Maurice Ogutu, Countryside Extension Center	708-352-0109	ogutu@uiuc.edu .
Elizabeth Wahle, Edwardsville Extension Center	618-692-9434	wahle@uiuc.edu
Bronwyn Aly, Dixon Springs Agricultural Center	618-695-2444	baly@uiuc.edu
Jeff Kindhart, Dixon Springs Agricultural Center	618-695-2444	jkindhar@uiuc.edu
Extension Educators in IPM		
Suzanne Bissonnette, Champaign Extension Center	217-333-4901	sbisson@uiuc.edu
George Czapar, Springfield Extension Center	217-782-6515	gfc@uiuc.edu
Dave Feltes, Quad Cities Extension Center	309-792-2500	dfeltes@uiuc.edu
Russell Higgins, Matteson Extension Center	708-720-7520	rahiggin@uiuc.edu
Campus-based Specialists		
Mohammad Babadoost, Plant Pathology	217-333-1523	babadoos@uiuc.edu
Mosbah Kushad, Fruit & Vegetable Production	217-244-5691	kushad@uiuc.edu
John Masiunas, Weed Science	217-244-4469	masiunas@uiuc.edu
Chuck Voigt, Vegetable Production (& herbs)	217-333-1969	cevoigt@uiuc.edu
Rick Weinzierl, Entomology	217-333-6651	weinzier@uiuc.edu

Return Address:

Rick Weinzierl
Department of Crop Sciences
University of Illinois
1102 South Goodwin Ave.
Urbana, IL 61801

UNIVERSITY OF ILLINOIS
EXTENSION